UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _23 November 2007_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-6 and 17-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6 and 17-25_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _05 August 2005_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

       1.☒ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Priority

1.   Acknowledgment is made of applicant's claim for foreign priority under 35

U.S.C. 119(a)-(d). The certified copy has been filed in the pending application.

Claim Objections

2.   Claims 6 and 17 are objected to because of the following informalities:

a.   In reference to claim 6, the phrase, "..for each pixel or cell individually" (see line

2 of the claim) should read, "...for each of a pixel or cell individually" in order to provide

correct antecedent basis.

b.   In reference to claim 17, the phrase, "...wherein at least of a phase, an

amplitude..." (see lines 6-7 of the claim) should read, "...wherein at least one of a phase,

an amplitude..."

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1, 2, 4-6, 17, 18, 21-23 and 25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lin (U.S. Patent 6,421,466 B1) in view of Frey (U.S. Patent 5,925,875).

In reference to claims 1 and 17, Lin discloses a method for processing video data (see

column 1, lines 5-8 and column 6, lines 26-31) for display on a display device having a plurality

of luminous elements (column 5, lines 61-64 disclose the display as having luminous elements)

by applying a dithering function to at least part of said video data (see column 8, lines 18-23).

Lin further discloses computing at least one motion vector from said video data (see column 7,

lines 1-17) and outputting the vector back into an encoded video stream as a substitute for that

block of video data (see column 4, lines 45-49). Although Lin does disclose calculating motion

estimation vectors from the video data, Lin does not explicitly disclose changing at least one of

the phase, amplitude, spatial resolution and temporal resolution of the dithering in accordance

with the calculated motion vector. Frey discloses an apparatus and method using a dithering

device to correct for differences in image detectors (see column 1, lines 13-16). Frey discloses

the dithering device filtering an image performing scene-to-scene registration to measure the

object space motion and to estimate a dither pattern from that motion (see column 10, lines 33-45

and Figure 12). Also, the filtering in Frey is explicitly disclosed as being a "temporal high pass

filter" (see column 3, lines 20-21). Frey further discloses the scene-to-scene registration

estimating the dither pattern by shifting a reference image signal relative to a previous image

frame by a number of pixels (see column 10, lines 51-53). Note, the Office interprets such

shifting of the reference image signal functionally equivalent to a change in spatial resolution of

the dither pattern since the dither pattern of Frey is directly related to the correlation of the

shifted image with previous image frame data. It would have been obvious to one of ordinary

skill in the art at the time the invention was made to implement the dither pattern modification based upon motion estimation techniques of Frey with the dithering and motion vector calculation techniques of Lin in order to adjust the dithering process on a scene-by-scene basis thereby creating a more precise dithering mechanism in video systems (see column 3, lines 51-60 of Frey). Further, in reference to claim 17, Lin further disclsoes a digital signal processor and memory for performing motion estimation (see column 7, liens 18-39 and Figure 5) while Frey discloses a dithering mechanism and signal processor for performing the above disclosed video processing techniques (see column 6, lines 15-25 and Figure 1). The Office interprets such elements as functionally equivalent to Applicant's dithering and motion estimation means. (further see *Response to Arguments* below).

In reference to claims 2 and 18, Lin and Frey disclose all of the claim limitations as applied to claims 1 and 17 respectively above. Frey further discloses the scene-to-scene registration estimating the dither pattern by shifting a reference image signal relative to a previous image frame by a number of pixels (see column 10, lines 51-53). Note, the Office interprets such shifting of the reference image signal functionally equivalent to a change in spatial resolution of the dither pattern since the dither pattern of Frey is directly related to the correlation of the shifted image with previous image frame data. Further, the Office interprets the shifting of Frey to inherently provide shifting in two dimensions (x, y or 2D dimensions of screen space, see also, column 12, lines 43-48) and since Frey discloses comparing the current image to a previous image frame, the Office interprets Frey to also disclose the dithering to incorporate a single temporal dimension. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dither pattern modification based

upon motion estimation techniques of Frey with the dithering and motion vector calculation

techniques of Lin in order to adjust the dithering process on a scene-by-scene basis thereby

creating a more precise dithering mechanism in video systems (see column 3, lines 51-60 of

Frey).

In reference to claims 4 and 20, Lin and Frey disclose all of the claim limitations as

applied to claim 1 above. Since Lin discloses that the "Y" or luminous component of the pixel

data is kept throughout the pixel manipulation processing (see column 8, lines 12-14), the Office

interprets Lin to disclose the dithering function based on single luminous elements. Lin

discloses wherein said at least one motion vector is defined for each pixel or cell individually

(see columns 6-7, lines 40-17 wherein the details of the motion vector computation for each pixel

is disclosed). Note, the Office interprets the "pixel" and "cell" elements of claim 20

interchangeable in this context especially in view of claim 6.

In reference to claims 5 and 21, Lin and Frey disclose all of the claim limitations as

applied to claims 1 and 17 respectively above in addition, Lin explicitly discloses performing

pixel-width reduction from 8 to 6 bits (see column 8, lines 15-18) which the Office interprets

equivalent to a 2-bit dithering.

In reference to claims 6 and 22, Lin and Frey disclose all of the claim limitations as

applied to claims 1 and 17 respectively above. Lin discloses wherein said at least one motion

vector is defined for each pixel or cell individually (see columns 6-7, lines 40-17 wherein the

details of the motion vector computation for each pixel is disclosed).

In reference to claim 23, Lin and Frey disclose all of the claim limitations as applied to claim 17 above in addition, Lin discloses the calculated motion vector to represent a difference in locations between two images of a macroblock or a divided frame of an image (see column 1, lines 21-28 and Figure 1). Also, Lin discloses computing at least one motion vector from said video data (see column 7, lines 1-17). Therefore, since the motion vector inherently represents a difference in position of a macroblock from frame to frame images and as shown in Figure 1 (#18 and how the vector shows the shifted to the left and down new position of the "current picture" as compared to the "old picture"), such location is performed on a two dimensional plane thereby inherently carrying two spatial dimensions from the position data.

In reference to claim 25, Lin and Frey disclose all of the claim limitations as applied to claim 17 above in addition, Frey discloses a signal processor performing the motion dithering using shifted image data on a frame-by-frame basis (see column 10, lines 46-65 and Figure 12). Note, the Office interprets the signal processor of Frey to operate functionally equivalent to the controlling means of Applicant's claim. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dither pattern modification based upon motion estimation techniques of Frey with the dithering and motion vector calculation techniques of Lin in order to adjust the dithering process on a scene-by-scene basis thereby creating a more precise dithering mechanism in video systems (see column 3, lines 51-60 of Frey).

4.   Claims 3, 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. Patent 6,421,466 B1), Frey (U.S. Patent 5,925,875) and further in view of Correa et al. (EP1136974 A1).

In reference to claims 3 and 19, Lin and Frey disclose all of the claim limitations as applied to claims 1 and 17 respectively above. Neither Lin nor Frey explicitly disclose the dithering function including the application of a plurality of masks or being based upon a plurality of masks. Correa et al. discloses a method for processing video data for display on a display device wherein dithering is applied and the dithering function includes the application of a plurality of masks (see page 9, paragraph 0038). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dithering masks of Correa et al. with the dither pattern modification and motion estimation techniques of Frey and dithering/motion vector calculation techniques of Lin in order in order to enhance the portrayal of grey scale values in video by adding an appropriate mask dither signal to the video signal (see page 2, paragraph 10 of Correa et al.).

In reference to claim 24, Lin and Frey disclose all of the claim limitations as applied to claim 17 above however, neither Lin nor Frey explicitly disclose a gamma function connected to the dithering means to precorrect input signals. Correa et al. discloses a system and method for processing video data for display on a display device wherein a gamma function means is connected to said dithering means (see paragraph 57 and #10 of Figure 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the teachings of Lin and Frey with the gamma processing techniques of Correa et al. in order to compensate for poor image quality pwm techniques in display devices by reducing the perceptibility of quantization noise in displayed video data (see paragraphs 7-8 of Correa et al.).

Response to Arguments

5.   The cancellation of claim 7 and addition of claims 17-25 are noted. Further, claims 17-

25 are noted as being reintroduced into the application and taken from co-pending application

11/504,562.

6.   Applicant's arguments, see pages 5-6 of Applicant's Remarks, filed 11/23/07, with

respect to the 35 USC 112 rejection of claims 1-6 have been fully considered and are persuasive.

The 35 USC 112 rejection of claims 1-6 has been withdrawn since an amendment to claim 1 has

remedied the previous issue.

7.   Applicant's arguments, see page 6 of Applicant's Remarks, filed 11/23/07, with respect

to the Double Patenting rejection of claims 1-6 have been fully considered and are persuasive.

The Double Patenting rejection of claims 1-6 has been withdrawn since claims 1-6 from

application 11/504,562 (relied upon in the double patenting rejection) are now incorporated into

the instant application as claims 17-25.

8.   Applicant's arguments, see page 7 of Applicant's Remarks, filed 11/23/07 and further

Applicant's Remarks filed 10/17/06, with respect to the rejection(s) of new claim(s) 17-25

(previously rejected in application 11/504,562 and now included in the instant application) under

35 USC 103(a) in view of Lin, Mikoshiba et al. and Correa et al., have been fully considered and

are persuasive. Therefore, the rejection has been withdrawn. However, upon further

consideration, a new ground(s) of rejection is made in view of Lin, Frey and Correa et al.. Note,

the Office has found a new interpretation of Frey in view of the "dithering improves [or refines]"

limitation of claims 1 and 17.

9.   Applicant's arguments filed 05/31/07 have been fully considered but they are not

persuasive.

In reference to claims 1-6, Applicant previously argued that Frey does not disclose

applying a dithering function to at least a part of video data to improve a gray scale portrayal of

video pictures (see page 3, 3rd paragraph of Applicant's Remarks dated 05/31/07). Further,

Applicant previously argued that although Frey does disclose a dithering device filtering an

image performing scene-to-scene registration to measure object space motion and to estimate a

dither pattern from that motion, the motion is utilized to estimate a dither pattern but is not used

to change some parameters of the dither pattern as proposed by the invention at hand (see pages

3-4, last though first paragraphs of Applicant's Remarks dated 05/31/07).

In response, the Office traverses such remarks and after a further review of the Frey

reference , believes that the dithering in Frey actually does improve or refine the video pictures

of video data. In particular, Frey explicitly discloses the invention to reduce fixed pattern noise

errors in the video pictures (image data) utilizing dithering of the image across a planar array of

detectors (see column 3, lines 5-8). This dithering leads to an image signal having an observed

image component and a fixed noise pattern that when further supplied to an image restoration

element and a high pass filter respectively, produce a filtered image signal sans noise errors (see

column 3, lines 20-27). Therefore, the Office interprets Frey to disclose applying a dither

function to at least part of video data (i.e. video pictures or images) that improves or refines the

video data since noise error patterns are eliminated from the data.

Further, Frey discloses the dithering device filtering an image performing scene-to-scene

registration to measure the object space motion and to estimate a dither pattern from that motion

(see column 10, lines 33-45 and Figure 12). Frey also discloses the scene-to-scene registration

estimating the dither pattern by shifting a reference image signal relative to a previous image

frame by a number of pixels (see column 10, lines 51-53). Note, the Office interprets such

shifting of the reference image signal functionally equivalent to a change in spatial resolution of

the dither pattern since the dither pattern of Frey is directly related to the correlation of the

shifted image with previous image frame data. Also, the filtering in Frey is explicitly disclosed

as being a "temporal high pass filter" (see column 3, lines 20-21).

Therefore the Office interprets the reference of Frey as applicable art as Frey discloses

the above argued limitations.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781.

The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:00

AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kee Tung, can be reached at (571) 272-7794.

Any response to this action should be mailed to:

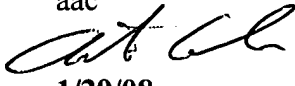Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

571-273-8300 (Central Fax)

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Technology Center 2600 Customer Service Office whose telephone

number is (571) 272-2600.

aac

1/29/08

Antonio Caschera
Patent Examiner